What We Claim Is:

1. A dry sprinkler comprising:

a structure defining a passageway extending along a longitudinal axis between an inlet and an outlet, the structure having a rated K-factor defining an expected flow of fluid in gallons per minute from the outlet divided by the square root of the pressure of the flow of fluid fed into the inlet of the passageway in pounds per square inch gauge;

a fluid deflecting structure proximate the outlet;

a locator movable along the longitudinal axis between a first position and a second position;

a metallic disc annulus having a face disposed about a central axis between an inner perimeter and an outer perimeter, the outer perimeter contacting the structure so that the face occludes a flow of fluid through the passageway when the locator is proximate the first position, the metallic disc annulus being arranged with the central axis of the face being skewed from the longitudinal axis within the passageway when the locator is proximate the second position so that a flow of fluid in gallons per minute from the outlet of the structure is at least 95 percent of the rated K-factor multiplied by the square root of the pressure of the flow of fluid fed into the inlet of the structure in pounds per square inch gauge.

2. The dry sprinkler of claim 1, wherein the locator comprises a closure body having a base portion connected to a yoke, the yoke having first, second and third wall portions, the first and second wall portions symmetric to a yoke axis, the third wall portion having a surface with a radius of curvature connecting the first and second wall portions, the yoke axis being offset to the longitudinal axis when the locator is in the second position.

3. The dry sprinkler of claim 2, wherein the locator comprises an aperture in the base portion, and wherein a pin is disposed in the aperture along an axis generally orthogonal and offset to the longitudinal axis when the locator is in the second position.

4. The dry sprinkler of claim 1, further comprising a member that contacts at least one of the locator and the metallic disc annulus to translate the face of the metallic disc annulus to a side of the longitudinal axis when the locator moves from the first position toward the second position.

5. The dry sprinkler of claim 2, wherein the member comprises a member selected from a group consisting of one of a torsion spring, helical coil spring, tension spring, tether, or crank arm.

6. The dry sprinkler of claim 1, further comprising a projection extending from the inner surface of the structure, the projection having a free end located in the passageway, the free end contacting at least one of the locator and metallic disc annulus to translate the face of the annulus to a side of the longitudinal axis when the locator moves from the first position towards the second position so as to permit a flow of fluid through the passageway between the inlet and outlet.

7. The dry sprinkler of claim 1, further comprising a member extending across the passageway and connecting to the inner surface of the structure at a plurality of points of the inner surface, the member contacting at least one of the locator and metallic disc annulus to translate the face of the annulus to a side of the longitudinal axis when the locator moves from the first position towards the second position.

8. The dry sprinkler of claim 1, wherein the structure comprises a tubular member disposed about the longitudinal axis, the tubular member having an inner surface and an outer surface surrounding the inner surface, the tubular member including a pair of bearings disposed between spaced points on the tubular member, each bearing having a bearing surface extending along the longitudinal axis between the inner and outer surfaces, and wherein the locator further comprises a member extending through a portion of the locator proximate the inlet, the member moving along the longitudinal axis on the bearing surface of the structure to translate the face of the

annulus to a side of the longitudinal axis when the locator moves from the first position towards the second position.

9. The dry sprinkler of claim 1, wherein the structure further comprises a groove formed in the inner surface of the passageway about the longitudinal axis proximate the inlet, and wherein the locator further comprises a resilient arcuate member that connects to the groove to form a pivot so that the face is movable about the longitudinal axis to permit a flow of fluid through the passageway between the inlet and outlet when the locator moves from the first position towards the second position.

10. The dry sprinkler of claim 1, wherein the locator comprises an elongate member and a closure body configured to support the metallic disc annulus, the elongate member having an edge proximate the inlet, the edge supporting the body on a line contact offset to the longitudinal axis such that the face translates to a position on a side of the longitudinal axis when the locator moves between the first and second position.

11. The dry sprinkler of claim 1, wherein the locator comprises a closure body having a disc support surface supporting the metallic disc annulus, and wherein the structure further comprises a projection extending from the inner surface of the structure towards the longitudinal axis in the passageway, the projection having a free end located in the passageway, the free end contacting the metallic disc annulus to separate the metallic disc annulus from the closure body such that the closure body falls in the passage proximate the outlet when the locator moves from the first position towards the second position.

12. The dry sprinkler of claim 1, wherein the locator further comprises a closure body and an elongate member extending along the longitudinal axis, the closure body having a first surface provided with a first radius of curvature facing the outlet, the elongate member having a second surface provided with a second radius of curvature facing the inlet and supporting the first

surface so that the first surface rotates on the second surface when the locator moves towards the second position.

13. The dry sprinkler of claim 1, wherein the inlet comprises a sealing surface disposed about the longitudinal axis proximate the inlet, and wherein the locator comprises a top portion extending toward the inlet past the sealing surface in the first position of the locator, the center of mass being moved by fluid flowing through the inlet so that the face is moved to a side of the longitudinal axis when the locator moves from the first position towards the second position.

14. The dry sprinkler of claim 1, wherein the inlet comprises a sealing surface disposed about the longitudinal axis proximate the inlet, and wherein the locator comprises a top portion having a chamber extending toward the inlet past the sealing surface in the first position of the locator, the chamber being filled with fluid flowing through the inlet so that the face is moved to a side of the longitudinal axis when the locator moves from the first position towards the second position.

15. The dry sprinkler of claim 1, further comprising a cord connected to the structure by a first attachment device and connected to the locator by a second attachment device such that the cord tethers the locator to the structure to move the face of the annulus to a side of the longitudinal axis when the locator moves from the first position towards the second position.

16. The dry sprinkler of claim 1, further comprising a compression spring extending between a portion of the locator disposed between the inlet and the outlet, the compression spring moving the face of the annulus to a side of the longitudinal axis when the locator moves from the first position towards the second position.

17. The dry sprinkler of claim 1, further comprising a tension spring extending between a portion of the locator to move the face of the annulus to a side of the longitudinal axis when the locator moves from the first position towards the second position.

18. The dry sprinkler of claim 1, wherein the structure comprises a spring seat and a compression spring disposed within the passageway proximate the inlet, the spring biasing the locator to move along the longitudinal axis relative to the structure, and wherein the locator comprises a closure body having a first pivot and a second pivot spaced from the first pivot with a first strap and a second strap, the first strap having a first length being connected to the first pivot and first end of the spring, the second strap having a second length greater than the first length being connected to the second pivot and second end of the spring, the second strap cooperating with the first strap to move the face of the annulus to a side of the longitudinal axis when the locator moves from the first position towards the second position.

19. The dry sprinkler of claim 1, wherein the structure comprises a compression spring disposed in the passageway proximate the inlet, and wherein the locator comprises at least one elongate member supporting a closure body, the closure body having a pivot with a strap connected to the pivot and a coil of the compression spring, the strap being movable between a first strap position where the strap is spaced from the at least one elongate member and a second strap position where the strap engages the at least one elongate member to move the face of the annulus to a first side of the longitudinal axis when the locator moves from the first position towards the second position.

20. The dry sprinkler of claim 1, further comprising first, second, and third bearings, the first and second bearings formed on a tubular member of the locator, the third bearing formed on a portion of the locator proximate the inlet, the portion of the locator including a throw journal located between first and second main journals, the first main journal being disposed within the first bearing, the second main journal being disposed within the second bearing, and the throw journal being disposed within the third bearing, the portion of the locator cooperating with the tubular member and with the metallic disc annulus to move the face of the annulus to a side of the longitudinal axis when the locator moves from the first position towards the second position.

21. The dry sprinkler of claim 1, further comprising first, second, and third bearings, the first and second bearings formed on a tubular member of the locator, the third bearing formed on a portion of the locator proximate the inlet, the portion including a throw journal located between first and second main journals, the first main journal being disposed within the first bearing, the second main journal being disposed within the second bearing, and the throw journal being in contiguous engagement with a surface of the portion facing the outlet when the locator is proximate the first position, the portion cooperating with the tubular member to move the face to a side of the longitudinal axis when the locator moves from the first position towards the second position.

22. The dry sprinkler of claim 1, wherein the locator comprises a support member having a plurality of apertures and a first contact area generally orthogonal to the longitudinal axis, the plurality of apertures perforating the support member and being spaced from the longitudinal axis, and the first contact area being coincident with the longitudinal axis, and wherein a bar is provided between a first end engaging the first contact area of the support member and a second end engaging a portion of the locator proximate the inlet when the locator is proximate the first position.

23. The dry sprinkler of claim 1, wherein the locator comprises a dislodgment member, a support member generally orthogonal to the longitudinal axis, the support member having a contact surface, a post, and a dislodgment aperture, the support member being spaced from the longitudinal axis and the contact surface being coincident with the longitudinal axis, the support member supporting the post and a portion of the locator proximate the inlet, the dislodgment member including a base and a projection, the base being supported by the inner surface of the structure, and projection extending from the base toward the inlet, the projection being aligned with and spaced from the dislodgment aperture when the locator is proximate the first position, and the projection penetrating the dislodgment aperture and displacing the post when the locator moves from the first position towards the second position.

24. The dry sprinkler of claim 1, wherein the locator comprises a projection extending away from the longitudinal axis in the passageway so that the projection obstructs a flow of fluid on one side of the longitudinal axis in the passageway so that the face of the annulus is moveable to a side of the longitudinal axis via fluid flowing around the projection when the locator is in the second position.

25. The dry sprinkler of claim 1, wherein the passageway comprises a first fluid flow area symmetrical about the longitudinal axis proximate the inlet and a second fluid flow area asymmetrical about the longitudinal axis spaced between the first flow area and the outlet, the second fluid flow area being greater than the first fluid flow area such that when a pressure differential between the first flow area and the second flow area is provided, the metallic disc annulus is proximate the asymmetrical flow area.

26. The dry sprinkler of claim 1, wherein the structure further comprises a tubular outer structure surrounding a tubular member of the locator, the tubular outer structure having a projection extending toward the longitudinal axis, the projection including a first bearing diametrically spaced apart from an aperture extending through a surface of the tubular member of the locator, the aperture having a groove extending along the longitudinal axis so that the locator is guided by the projection of the tubular outer structure along the longitudinal axis, wherein the locator further comprises a closure body having a central journal located between a main journal and an impact shoe, the main journal being disposed within the first bearing, the central journal located in a second bearing of the closure body, and the impact shoe being disposed within the aperture, the impact shoe of the closure body cooperating with the projection to move a portion of the face to a side of the longitudinal axis when the locator moves from the first position towards the second position.

27. The dry sprinkler of claim 1, wherein the inlet comprises a generally cylindrical outer surface having one of $^{3}/_{4}$ inch, 1 inch, 1.25 inch NPT and 7-1 ISO threads formed thereon.

28. The dry sprinkler of claim 27, wherein the inlet further comprises a truncated conical surface facing the longitudinal axis adjacent the planar annulus surface, the truncated conical surface extending at an angle of about thirty degree with respect to the longitudinal axis.

29. The dry sprinkler of claim 1, wherein the inlet comprises an entrance surface having a first end and a second end disposed along and surrounding the longitudinal axis and a seat surface adjacent the second end of the entrance surface.

30. The dry sprinkler of claim 29, wherein the entrance surface comprise a convex surface surrounding the longitudinal axis and the seat surface comprises a planar annulus surface surrounding the longitudinal axis.

31. The dry sprinkler of claim 30, wherein the inlet further comprises an oblique surface adjacent the planar annulus surface.

32. The dry sprinkler of claim 31, wherein the inlet further comprises a surface oblique to the longitudinal axis surface adjacent the planar annulus surface.

33. The dry sprinkler of claim 32, wherein the face of the disc annulus comprises a generally planar surface contacting the planar annulus surface when the locator is proximate the first position.

34. The dry sprinkler of claim 33, wherein the face of the disc annulus comprises a truncated conical surface extending towards the planar annulus surface when the locator is proximate the second position.

35. The dry sprinkler of claim 34, wherein the locator comprises a seat that supports the metallic disc annulus.

36. The dry sprinkler of claim 35, wherein the locator comprises a closure body coupled to a yoke, the closure body having a top portion and a base portion, the top portion having at least one surface providing a seat for the metallic disc annulus, the yoke having a first wall portion and a second wall portion symmetric about a yoke axis, the first wall portion and the second wall portion being coupled to the surface of the base portion of the closure body.

37. The dry sprinkler of claim 36, wherein the top portion comprises a surface defining a blind hole.

38. The dry sprinkler of claim 37, wherein the structure includes a first tubular portion connected to a second tubular portion, and a third tubular portion spaced from the first tubular portion and connected to the second tubular portion, the first tubular portion having a first set of threads formed on one of inner and outer surfaces of the first tubular portion, the second tubular portion having second and third sets of threads, the second set of threads formed proximate a first end of the second tubular portion on one of outer and inner surfaces, the third set of threads formed proximate a second end of the second tubular portion on one of inner and outer surfaces, and a fourth set of threads formed on one of outer and inner surfaces of the third tubular portion; and wherein the first set of threads engages the second set of threads, and the third set of threads engages the fourth set of threads.

39. The dry sprinkler of claim 38, wherein the structure comprises a length from the inlet to the outlet between two to fifty inches.

40. The dry sprinkler of claim 39, wherein the structure further comprises a coil spring disposed about the longitudinal axis within the tubular outer structure proximate the inlet, the coil biasing the multi-legged yoke along the longitudinal axis towards the outlet.

41. The dry sprinkler of claim 40, wherein the fluid tube comprises a fluid tube connected to a guide tube, each of the fluid and guide tube comprises an outer generally cylindrical wall

surface spaced from an inner generally cylindrical wall surface along and about the longitudinal axis so as to define a fluid tube passage, the fluid tube and guide tube being surrounded by the second tubular portion.

42. The dry sprinkler of claim 41, wherein the outer generally cylindrical wall surface of the guide tube comprises a diameter between diametrical wall surfaces of a magnitude less than the diameter between diametrical wall surfaces of the inner generally cylindrical wall surface of the fluid tube, the guide tube comprises a first guide tube portion and a second guide tube portion, the first guide tube portion being fixed to another end of the fluid tube, the second guide tube portion being connected to the trigger assembly.

43. The dry sprinkler of claim 42, wherein the trigger assembly comprises a trigger seat, a trigger and a retention member disposed between the fluid tube and the fluid deflecting structure.

44. The dry sprinkler of claim 43, wherein the third tubular portion comprises at least one frame arm connected to the third tubular portion.

45. The dry sprinkler of claim 44, wherein the trigger seat comprises a generally cylindrical plug having a first plug portion extending in the outlet and second plug portion forming a nub connected to the trigger.

46. The dry sprinkler of claim 45, wherein the retention member comprises an elongate member fixed to the fluid deflecting structure and coupled to the at least one frame arm.

47. The dry sprinkler of claim 46, wherein the trigger comprises a temperature responsive trigger being retained between the seat trigger and the retention member, the temperature responsive trigger being operative to: (1) maintain the inner tubular assembly proximate the first position over the first range of temperatures between minus 60 degrees Fahrenheit to a temperature just below a rated temperature of the trigger; and (2) permit the inner tubular

assembly to move along the longitudinal axis to the second position over a second range of temperatures greater than or equal to the rated temperature of the trigger.

48. The dry sprinkler of claim 1, wherein the pressure of the flow fed into the inlet comprises a plurality of start pressures between 0 and 175 psig.

49. The dry sprinkler of claim 48, wherein the plurality of start pressures comprises one of 20 psig and 100 psig.

50. The dry sprinkler of claim 48, wherein the K-factor comprises a K-factor of at least one of about 5.6, 8.0, 11.2, 14.0 and 16.8.

51. A dry sprinkler comprising:

a structure defining a passageway extending along a longitudinal axis between an inlet and an outlet, the structure having a rated K-factor defining an expected flow of fluid in gallons per minute from the outlet divided by the square root of the pressure of the flow of fluid fed into the inlet of the passageway in pounds per square inch gauge;

a fluid deflecting structure proximate the outlet;

a metallic disc annulus having a face disposed about a central axis between an inner perimeter and an outer perimeter; and

means for repositioning the central axis of the face skewed to the longitudinal axis within the passageway so that a flow of fluid in gallons per minute from the outlet of the structure is at least 95 percent of the rated K-factor multiplied by the square root of the pressure of the flow of fluid fed into the inlet of the structure in pounds per square inch gauge.

52. A dry sprinkler comprising:

a tubular outer structure defining a passageway extending along a longitudinal axis between an inlet and an outlet;

an inner tubular assembly disposed within the outer structure and movable along the longitudinal axis in the passageway between a first position and a second position, the tubular inner assembly including:

a yoke, the yoke having first and second legs extending along a yoke axis;

and

a fluid tube supporting the yoke at one end of the fluid tube;

a closure assembly supported by the yoke, the closure assembly including a surface occluding a flow of fluid in the passageway when the tubular inner assembly is proximate the first position;

a pin extending through the legs of the yoke and a portion of the closure assembly so that the closure assembly rotates via the pin about an axis generally orthogonal to the longitudinal axis and offset thereto when the inner tubular assembly moves from the first position towards the second position so as to permit a flow of fluid through the passageway between the inlet and outlet;

a temperature responsive trigger assembly proximate the outlet of the tubular outer structure; and

a fluid deflecting structure proximate the outlet of the tubular outer structure.

53. A dry sprinkler comprising:

an outer structure defining a passageway and extending along a longitudinal axis between an inlet and an outlet, the passageway having a K-factor greater than 8.0, the K-factor being determined by the flow of fluid in gallons per minute through the outlet divided by the square root of the pressure of fluid fed into the inlet of the passageway in pounds per square inch gauge;

a tubular inner assembly disposed within the tubular outer structure and movable in the passageway, the tubular inner assembly is movable along the longitudinal axis between a first position and a second position, the tubular inner assembly including:

a multi-legged yoke, the multi-legged yoke having a first yoke support end and a second yoke support end, the first yoke support end including at least one elongate member, the second yoke support end including at least two support legs

extending from the at least one elongate member;

a fluid tube supporting the multi-legged yoke; and

a guide tube coupled to the fluid tube;

a closure assembly coupled to the at least one elongate member of the first yoke support end, the closure assembly including a surface occluding a flow of fluid into the passageway when the inner tubular assembly is proximate the first position;

a resilient member that biases the closure assembly to translate the surface to a side of the longitudinal axis when the inner tubular assembly moves from the first position toward the second position; and

a fluid deflecting structure proximate the outlet of the tubular outer structure.

54. The dry sprinkler of claim 53, wherein the closure assembly includes a conical portion extending between a first end and a second end along the longitudinal axis, the second end having an eyelet coupled to the elongate member of the yoke via a pin disposed generally orthogonal to the longitudinal axis.

55. A dry sprinkler comprising:

a tubular outer structure defining a passageway extending along a longitudinal axis between an inlet and an outlet;

a tubular inner assembly disposed within the tubular outer structure and movable along the longitudinal axis in the passageway between a first position and a second position, the tubular inner assembly including:

a multi-legged yoke, the multi-legged yoke having a first yoke support end and a second yoke support end, the first yoke support end including at least one elongate member, the second yoke support end including at least two support legs extending from the at least one elongate member; and

a fluid tube supporting the multi-legged yoke at one end of the fluid tube;

a closure assembly supported by the at least one elongate member of the first yoke support end, the closure assembly including a surface occluding a flow of fluid in the passageway when the tubular inner assembly is proximate the first position;

a projection extending from the tubular outer structure, the projection having a free end located in the passageway, the free end contacting the closure assembly to translate the surface to a side of the longitudinal axis when the inner tubular assembly moves from the first position towards the second position so as to permit a flow of fluid through the passageway between the inlet and outlet;

a temperature responsive trigger assembly proximate the outlet of the tubular outer structure; and

a fluid deflecting structure proximate the outlet of the tubular outer structure.

56. The dry sprinkler of claim 55, wherein the first tubular portion comprises an inlet having an inlet outer surface and inlet inner surface cincturing a sleeve, the sleeve being connected to the projection and a free end of the projection comprises a unitary portion of the sleeve extending generally transverse to the longitudinal axis.

57. The dry sprinkler of claim 56, wherein the sleeve comprises a projection opening extending generally transverse to the longitudinal axis through a wall of the sleeve, the projection being disposed in the projection opening of the sleeve so as to extend generally transverse to the longitudinal axis.

58. A dry sprinkler comprising:

a tubular outer structure defining a passageway extending along a longitudinal axis between an inlet and an outlet, the tubular outer structure having an inner surface surrounded by an outer surface about the longitudinal axis;

a tubular inner assembly disposed within the tubular outer structure and movable along the longitudinal axis in the passageway between a first position and a second position, the tubular inner assembly including:

[redacted]

a multi-legged yoke, the multi-legged yoke having a first yoke support end and a second yoke support end, the first yoke support end including at least one elongate member, the second yoke support end including at least two support legs extending from the at least one elongate member; and

a fluid tube supporting the multi-legged yoke at one end of the fluid tube;

a closure assembly supported by the at least one elongate member of the first yoke support end, the closure assembly including a surface occluding a flow of fluid in the passageway when the tubular inner assembly is proximate the first position;

a member extending across the passageway and connecting to the inner surface at a plurality of points of the tubular outer structure, the member contacting the closure assembly to translate the surface to a side of the longitudinal axis when the inner tubular assembly moves from the first position towards the second position so as to permit a flow of fluid through the passageway between the inlet and outlet;

a temperature responsive trigger assembly proximate the outlet of the tubular outer structure; and

a fluid deflecting structure proximate the outlet of the tubular outer structure.

59. The dry sprinkler of claim 58, wherein the member comprises a bar located offset to the longitudinal axis.

60. The dry sprinkler of claim 59, wherein the first tubular portion comprises an inlet having an inlet outer surface and inlet inner surface cincturing a sleeve, the sleeve being connected to the member.

61. The dry sprinkler of claim 60, wherein the sleeve comprises a pair of openings extending generally transverse to the longitudinal axis through the wall of the sleeve between spaced points, the member being disposed in the pair of openings of the sleeve so as to extend generally offset to the longitudinal axis.

62. A dry sprinkler comprising:

a tubular outer structure defining a passageway extending along a longitudinal axis between an inlet and an outlet, the tubular outer structure having an inner surface surrounded by an outer surface about the longitudinal axis, the tubular outer structure having a pair of bearings disposed between spaced points of the inner surface of the inlet, each bearing having a bearing surface extending along the longitudinal axis;

a tubular inner assembly disposed within the tubular outer structure and movable along the longitudinal axis in the passageway between a first position and a second position, the tubular inner assembly including:

a multi-legged yoke, the multi-legged yoke having a first yoke support end and a second yoke support end, the first yoke support end including at least one elongate member, the second yoke support end including at least two support legs extending from the at least one elongate member; and

a fluid tube supporting the multi-legged yoke at one end of the fluid tube;

a closure assembly supported by the at least one elongate member o f the first yoke support end, the closure assembly including a surface occluding a flow of fluid in the passageway when the tubular inner assembly is proximate the first position;

a member extending through the closure assembly, the member moving along the bearing surface to translate the surface to a side of the longitudinal axis when the inner tubular assembly moves from the first position towards the second position so as to permit a flow of fluid through the passageway between the inlet and outlet;

a temperature responsive trigger assembly proximate the outlet of the tubular outer structure; and

a fluid deflecting structure proximate the outlet of the tubular outer structure.

63. The dry sprinkler of claim 62, wherein the first tubular portion comprises an inlet having an inlet outer surface and inlet inner surface cincturing a sleeve, the sleeve being coupled to the member, the sleeve including a pair of bearings located at spaced points on the interior surface of the sleeve.

64. The dry sprinkler of claim 63, wherein the member comprises a bar journaled to the sleeve via respective open ends of the bearings, the bar being fixed to the closure assembly so that the bar is rotatable with the closure assembly as the tubular inner assembly moves toward the second position.

65. The dry sprinkler of claim 64, wherein the sleeve comprises a pair of arcuate openings extending generally transverse to the longitudinal axis through the wall of the sleeve between spaced points, the bar being journaled to the pair of arcuate openings of the sleeve so as to permit two degrees of freedom of movement of the bar.

66. A dry sprinkler comprising:

a tubular outer structure defining a passageway extending along a longitudinal axis between an inlet and an outlet, the tubular outer structure having a groove formed in the passageway about the longitudinal axis;

a tubular inner assembly disposed within the tubular outer structure and movable along the longitudinal axis in the passageway between a first position and a second position, the tubular inner assembly including:

a multi-legged yoke, the multi-legged yoke having a first yoke support end and a second yoke support end, the first yoke support end including at least one elongate member, the second yoke support end including at least two support legs extending from the at least one elongate member; and

a fluid tube supporting the multi-legged yoke at one end of the fluid tube;

a closure assembly supported by the at least one elongate member of the first yoke support end, the closure assembly including a surface occluding a flow of fluid in the passageway when the tubular inner assembly is proximate the first position, the closure assembly having a resilient clip that forms a pivot, the clip being connected to the groove so that the pivot is movable about the longitudinal axis and permits the closure member to rotate about the pivot

to permit a flow of fluid through the passageway between the inlet and outlet when the inner tubular assembly moves from the first position towards the second position;

a temperature responsive trigger assembly proximate the outlet of the tubular outer structure; and

a fluid deflecting structure proximate the outlet of the tubular outer structure.

67. The dry sprinkler of claim 66, wherein the clip comprises a generally arcuate spring extending through an opening on the closure assembly, the opening permitting the closure assembly to move with two degrees of freedom with respect to the generally arcuate spring.

68. The dry sprinkler of claim 67, wherein the clip comprises an arcuate spring wire extending about the longitudinal axis so that one end of the wire is spaced from another end and at least a portion of the spring wire is disposed in the groove formed circumferentially about the longitudinal axis.

69. A dry sprinkler comprising:

a tubular outer structure defining a passageway extending along a longitudinal axis between an inlet and an outlet, the inlet having a central axis coincident with the longitudinal axis;

a tubular inner assembly disposed within the tubular outer structure and movable along the longitudinal axis in the passageway between a first position and a second position, the tubular inner assembly including:

a multi-legged yoke, the multi-legged yoke having a first yoke support end and a second yoke support end, the first yoke support end including at least one elongate member having a first planar surface intersecting a second planar surface to form an edge offset to the longitudinal axis, the second yoke support end including at least two support legs extending from the at least one elongate member; and

a fluid tube supporting the multi-legged yoke at one end of the fluid tube;

a closure assembly having a support surface bearing against the edge of the first yoke support end, the closure assembly including a surface occluding a flow of fluid in the passageway when the tubular inner assembly is proximate the first position and permitting fluid flow through the passageway when the inner tubular assembly moves from the first position towards the second position;

a temperature responsive trigger assembly proximate the outlet of the tubular outer structure; and

a fluid deflecting structure proximate the outlet of the tubular outer structure.

70. The dry sprinkler of claim 69, wherein at least one of the first planar surface and second planar surface extends through the longitudinal axis to form a planar surface generally oblique to the longitudinal axis so that the edge extends generally orthogonal to the longitudinal axis.

71. The dry sprinkler of claim 70, wherein the first end and the support surface contact at a line contact generally offset to the longitudinal axis at a radial distance of about 0.05 inches.

72. A dry sprinkler comprising:

a tubular outer structure defining a passageway extending along a longitudinal axis between an inlet and an outlet;

a tubular inner assembly disposed within the tubular outer structure and movable along the longitudinal axis in the passageway between a first position and a second position, the tubular inner assembly including:

a multi-legged yoke, the multi-legged yoke having a first yoke support end and a second yoke support end, the first yoke support end including at least one elongate member, the second yoke support end including at least two support legs extending from the at least one elongate member; and

a fluid tube supporting the multi-legged yoke at one end of the fluid tube;

a closure assembly supported by the at least one elongate member of the first yoke support end, the closure assembly including a closure body and a Belleville situated on the

closure body, the closure assembly occluding a flow of fluid in the passageway when the tubular inner assembly is proximate the first position;

a projection extending from the tubular outer structure towards the longitudinal axis, the projection having a free end located in the passageway, the free end contacting the metallic disc annulus to separate the metallic disc annulus from the closure body such that the closure body falls in the fluid tube when the inner tubular assembly moves from the first position towards the second position so as to permit a flow of fluid through the passageway between the inlet and outlet;

a temperature responsive trigger assembly proximate the outlet of the tubular outer structure; and

a fluid deflecting structure proximate the outlet of the tubular outer structure.

73. The dry sprinkler of claim 72, wherein the first tubular portion comprises an inlet having an inlet outer surface and inlet inner surface cincturing a sleeve, the sleeve being connected to the projection with a free end of the projection forming a unitary portion of the sleeve extending generally transverse to the longitudinal axis.

74. The dry sprinkler of claim 73, wherein the sleeve comprises a projection opening extending generally transverse to the longitudinal axis through a wall of the sleeve, the projection being coupled to the projection opening of the sleeve so as to extend generally transverse to the longitudinal axis.

75. A dry sprinkler comprising:

a tubular outer structure defining a passageway extending along a longitudinal axis between an inlet and an outlet;

a tubular inner assembly disposed within the tubular outer structure and movable along the longitudinal axis in the passageway between a first position and a second position, the tubular inner assembly including:

a multi-legged yoke, the multi-legged yoke having a first yoke support end and a second yoke support end, the first yoke support end including a support surface, the second yoke support end including at least two support legs extending from the at least one elongate member; and

a fluid tube supporting the multi-legged yoke at one end of the fluid tube;

a closure assembly having a planar base connected to an extension, the extension having a radius of curvature surface bearing against the support surface of the first yoke support end, the closure assembly including a surface occluding a flow of fluid in the passageway when the tubular inner assembly is proximate the first position and permitting fluid flow through the passageway when the inner tubular assembly moves from the first position towards the second position;

a temperature responsive trigger assembly proximate the outlet of the tubular outer structure; and

a fluid deflecting structure proximate the outlet of the tubular outer structure.

76. The dry sprinkler of claim 75, wherein the at least two support legs comprise a unitary member with the at least one elongate member, the two support legs each having a portion converging toward the longitudinal axis.

77. The dry sprinkler of claim 76, wherein the at least one elongate member comprises a first end contacting the extension of the closure assembly in the first position of the tubular inner assembly, the first end forming a generally planar surface.

78. A dry sprinkler comprising:

a tubular outer structure defining a passageway extending along a longitudinal axis between an inlet and an outlet, the inlet having a sealing surface disposed about the longitudinal axis proximate the inlet;

a tubular inner assembly disposed within the tubular outer structure and movable along the longitudinal axis in the passageway between a first position and a second position, the tubular inner assembly including:

a multi-legged yoke, the multi-legged yoke having a first yoke support end and a second yoke support end, the first yoke support end including at least one elongate member, the second yoke support end including at least two support legs extending from the at least one elongate member; and

a fluid tube supporting the multi-legged yoke at one end of the fluid tube;

a closure assembly supported by the at least one elongate member of the first yoke support end, the closure assembly including a surface having a top portion extending toward the inlet past the sealing surface and occluding a flow of fluid in the passageway when the tubular inner assembly is proximate the first position and permitting fluid flow through the passageway when the inner tubular assembly moves from the first position towards the second position;

a temperature responsive trigger assembly proximate the outlet of the tubular outer structure; and

a fluid deflecting structure proximate the outlet of the tubular outer structure.

79. The dry sprinkler of claim 78, wherein the at least two support legs comprise a unitary member with the at least one elongate member, the two support legs each having a portion converging toward the longitudinal axis.

80. The dry sprinkler of claim 79, wherein the at least one elongate member comprises a first end contacting a support surface of the closure assembly in the first position of the tubular inner assembly, the first end forming a generally arcuate surface and the support surface forming a generally planar surface and wherein the first end and the support surface contact at a position generally coincident on the longitudinal axis.

81. A dry sprinkler comprising:

a tubular outer structure defining a passageway extending along a longitudinal axis between an inlet and an outlet, the inlet having a sealing surface disposed about the longitudinal axis proximate the inlet;

a tubular inner assembly disposed within the tubular outer structure and movable along the longitudinal axis in the passageway between a first position and a second position, the tubular inner assembly including:

a multi-legged yoke, the multi-legged yoke having a first yoke support end and a second yoke support end, the first yoke support end including at least one elongate member, the second yoke support end including at least two support legs extending from the at least one elongate member; and

a fluid tube supporting the multi-legged yoke at one end of the fluid tube;

a closure assembly supported by the at least one elongate member of the first yoke support end, the closure assembly including a top portion having a chamber extending toward the inlet past the sealing surface and occluding a flow of fluid in the passageway when the tubular inner assembly is proximate the first position and permitting fluid flow through the passageway when the inner tubular assembly moves from the first position towards the second position;

a temperature responsive trigger assembly proximate the outlet of the tubular outer structure; and

a fluid deflecting structure proximate the outlet of the tubular outer structure.

82. The dry sprinkler of claim 81, wherein the surface of the closure assembly comprises an annular sealing portion that engages the sealing surface the tubular outer structure when the tubular inner assembly is proximate the first position.

83. The dry sprinkler of claim 82, wherein the closure assembly comprises a body extending between the support surface and the head portion, the annular sealing surface being mounted on a boss portion located between the support surface and the head portion, the chamber of the top portion projecting through the inlet.

84. A dry sprinkler comprising:

a tubular outer structure defining a passageway extending along a longitudinal axis between an inlet and an outlet;

a tubular inner assembly disposed within the tubular outer structure and movable along the longitudinal axis in the passageway between a first position and a second position, the tubular inner assembly including:

a multi-legged yoke, the multi-legged yoke having a first yoke support end and a second yoke support end, the first yoke support end including at least one elongate member, the second yoke support end including at least two support legs extending from the at least one elongate member; and

a fluid tube supporting the multi-legged yoke;

a closure assembly supported by the at least one elongate member of the first yoke support end, the closure assembly including a surface occluding a flow of fluid in the passageway when the tubular inner assembly is proximate the first position;

a cord connected to the tubular outer structure by a first attachment device and connected to the closure assembly by a second attachment device such that the cord tethers the closure assembly to the tubular outer structure to move the surface to a side of the longitudinal axis when the inner tubular assembly moves from the first position towards the second position; and

a fluid deflecting structure proximate the outlet of the tubular outer structure.

85. The dry sprinkler of claim 84, wherein the cord tethers the closure assembly proximate the at least one elongate member when the generally tubular inner assembly is proximate the second position.

86. The dry sprinkler of claim 85, wherein the closure assembly further comprises a surface facing the outlet, the outlet facing surface including a peripheral edge, the cord being connected to the outlet facing surface proximate the peripheral edge.

87. A dry sprinkler comprising:

[redacted]

a tubular outer structure defining a passageway extending along a longitudinal axis between an inlet and an outlet;

a tubular inner assembly disposed within the tubular outer structure and movable along the longitudinal axis in the passageway between a first position and a second position, the tubular inner assembly including:

a multi-legged yoke, the multi-legged yoke having a first yoke support end and a second yoke support end, the first yoke support end including at least one elongate member, the second yoke support end including at least two support legs extending from the at least one elongate member; and

a fluid tube supporting the multi-legged yoke;

a closure assembly supported by the at least one elongate member of the first yoke support end, the closure assembly including a surface occluding a flow of fluid in the passageway when the tubular inner assembly is proximate the first position;

a compression spring extending between the closure assembly and the multi-legged yoke to push the surface to a side of the longitudinal axis when the tubular inner assembly moves from the first position towards the second position; and

a fluid deflecting structure proximate the outlet of the tubular outer structure.

88. The dry sprinkler of claim 87, wherein the multi-legged yoke further comprises a post extending parallel to and offset from the longitudinal axis, the compression spring being disposed about the post with a first end mounted on the multi-legged yoke and a second end biasing the closure assembly such that the compression spring expands along the post when the tubular inner assembly moves from proximate the first position to proximate the second position.

89. The dry sprinkler of claim 88, wherein the multi-legged yoke further comprises a boss supporting the first end of the compression spring; wherein the closure assembly further comprises a surface facing the outlet, the surface facing the outlet including a spring retainer offset from the longitudinal axis, the second end of the compression spring engaging the spring retainer when the tubular inner assembly is proximate the first position.

90. The dry sprinkler of claim 89, wherein the first end of the compression spring being secured to the multi-legged yoke and the second end of the compression spring extends beyond the post, the compression spring including a coil spring disposed about the post.

91. A dry sprinkler comprising:

a tubular outer structure defining a passageway extending along a longitudinal axis between an inlet and an outlet;

a tubular inner assembly disposed within the tubular outer structure and movable along the longitudinal axis in the passageway between a first position and a second position, the tubular inner assembly including:

a multi-legged yoke, the multi-legged yoke having a first yoke support end and a second yoke support end, the first yoke support end including at least one elongate member, the second yoke support end including at least two support legs extending from the at least one elongate member; and

a fluid tube supporting the multi-legged yoke;

a closure assembly contacting the at least one elongate member of the first yoke support end, the closure assembly including a surface occluding a flow of fluid in the passageway when the tubular inner assembly is proximate the first position;

a tension spring extending between the closure assembly and the multi-legged yoke to pull the surface to a side of the longitudinal axis when the tubular inner assembly moves from the first position towards the second position; and

a fluid deflecting structure proximate the outlet of the tubular outer structure.

92. The dry sprinkler of claim 91, wherein the tension spring includes a first end connected to the multi-legged yoke and a second end connected to the closure assembly such that the tension spring contracts when the tubular inner assembly moves from proximate the first position toward the second position.

93. The dry sprinkler of claim 92, wherein the closure assembly further comprises a surface facing the outlet, the first end of the tension spring being connected to the multi-legged yoke and the second end of the tension spring being connected to the outlet facing surface, the tension spring including a coil spring.

94. A dry sprinkler comprising:

a tubular outer structure defining a passageway extending along a longitudinal axis between an inlet and an outlet, the longitudinal axis being located at a center of a cross-section of the tubular outer structure;

a tubular inner assembly disposed within the tubular outer structure and movable along the longitudinal axis in the passageway between a first position and a second position, the tubular inner assembly including:

a multi-legged spring seat having a central portion and at least two support legs extending from the central portion; and

a fluid tube supporting the multi-legged spring seat;

a compression spring supported on the multi-legged spring seat and biasing the tubular inner structure to move along the longitudinal axis relative to the tubular outer structure, the compression spring having a first coil proximate a first end of the compression spring and a second coil proximate a second end of the compression spring;

a closure assembly including a first pivot, a second pivot spaced from the first pivot, and a surface occluding a flow of fluid in the passageway when the tubular inner assembly is proximate the first position;

a first strap having a first length being connected to the first pivot and to the first coil;

a second strap having a second length greater than the first length being connected to the second pivot and to the second coil, the second strap cooperating with the first strap to move the surface to a side of the longitudinal axis when the tubular inner assembly moves from the first position towards the second position; and

a fluid deflecting structure proximate the outlet of the tubular outer structure.

95. The dry sprinkler of claim 94, wherein the first pivot comprises a first pivot axis transverse to the longitudinal axis and the second pivot includes a second pivot axis transverse to the longitudinal axis.

96. The dry sprinkler of claim 95, wherein the closure assembly further includes a surface facing the outlet, the first pivot and the second pivot each extending from the outlet facing surface such that the first pivot and the second pivot being spaced approximately equidistant from the longitudinal axis when the tubular inner assembly is proximate the first position.

97. A dry sprinkler comprising:

a tubular outer structure defining a passageway extending along a longitudinal axis between an inlet and an outlet, the longitudinal axis being located at a center of a cross-section of the tubular outer structure;

a tubular inner assembly disposed within the tubular outer structure and movable along the longitudinal axis in the passageway between a first position and a second position, the tubular inner assembly including:

a multi-legged yoke, the multi-legged yoke having a first yoke support end and a second yoke support end, the first yoke support end including at least one elongate member, the second yoke support end including at least two support legs extending from the at least one elongate member; and

a fluid tube supporting the multi-legged yoke;

a compression spring having at least one coil and biasing the tubular inner structure to move along the longitudinal axis relative to the tubular outer structure;

a closure assembly supported by the at least one elongate member of the first yoke support end, the closure assembly including a pivot and a surface occluding a flow of fluid in the passageway when the tubular inner assembly is proximate the first position;

a strap connected to the pivot and to the at least one coil of the compression spring, the strap being movable between a first strap position where the strap is spaced from the at least one elongate member and a second strap position where the strap engages the at least one elongate

member to move the surface to a first side of the longitudinal axis when the inner tubular assembly moves from the first position towards the second position; and

a fluid deflecting structure proximate the outlet of the tubular outer structure.

98. The dry sprinkler of claim 97, wherein closure assembly further comprises a surface facing the outlet, the pivot extending from the outlet facing surface on a second side of the longitudinal axis opposite from the first side of the longitudinal axis when the tubular inner assembly is proximate the first position, the pivot including a pivot axis transverse to the longitudinal axis.

99. The dry sprinkler of claim 98, wherein the strap has a length sufficient to move the pivot from the second side of the longitudinal axis to the first side of the longitudinal axis when the strap is moved to the second strap position and engages the at least one elongated member.

100. A dry sprinkler comprising:

a tubular outer structure defining a passageway extending along a longitudinal axis between an inlet and an outlet, the longitudinal axis being located at a center of a cross-section of the tubular outer structure;

a tubular inner assembly including a fluid tube, the tubular inner assembly being disposed within the tubular outer structure and movable along the longitudinal axis in the passageway between a first position and a second position, and the fluid tube including first and second bearings;

a closure assembly including a third bearing and a surface, the third bearing proximate the longitudinal axis with respect to the first and second bearings, and the surface occluding a flow of fluid in the passageway when the tubular inner assembly is proximate the first position;

a member including a throw journal located between first and second main journals, the first main journal being disposed within the first bearing, the second main journal being disposed within the second bearing, and the throw journal being disposed within the third bearing, the member cooperating with the fluid tube and with the closure assembly to move the surface to a

side of the longitudinal axis when the inner tubular assembly moves from the first position towards the second position; and

a fluid deflecting structure proximate the outlet of the tubular outer structure.

101. The dry sprinkler of claim 100, wherein the first main, second main, and throw journals lie in a plane that includes the longitudinal axis when the tubular inner assembly is proximate the first position.

102. The dry sprinkler of claim 101, wherein the first main, second main, and throw journals lie in a plane that is oblique with respect to the longitudinal axis when the tubular inner assembly is proximate the first position.

103. A dry sprinkler comprising:

a tubular outer structure defining a passageway extending along a longitudinal axis between an inlet and an outlet, the longitudinal axis being located at a center of a cross-section of the tubular outer structure;

a tubular inner assembly including a fluid tube, the tubular inner assembly being disposed within the tubular outer structure and movable along the longitudinal axis in the passageway between a first position and a second position, and the fluid tube including first and second bearings;

a closure assembly including first and second surfaces, the first surface occluding a flow of fluid in the passageway when the tubular inner assembly is proximate the first position, and the second surface generally facing the outlet of the tubular outer structure;

a member including a throw journal located between first and second main journals, the first main journal being disposed within the first bearing, the second main journal being disposed within the second bearing, and the throw journal being in contiguous engagement with the second surface when the tubular inner assembly is proximate the first position, the member cooperating with the fluid tube and with the closure assembly to move the surface to a side of the

longitudinal axis when the inner tubular assembly moves from the first position towards the second position; and

a fluid deflecting structure proximate the outlet of the tubular outer structure.

104. The dry sprinkler of claim 103, wherein the second surface of the closure assembly comprises a recess partially receiving the throw journal.

105. The dry sprinkler of claim 104, wherein the first main, second main, and throw journals lie in a plane that includes the longitudinal axis when the tubular inner assembly is proximate the first position.

106. The dry sprinkler of claim 105, wherein the first main, second main, and throw journals lie in a plane that is oblique with respect to the longitudinal axis when the tubular inner assembly is proximate the first position.

107. A dry sprinkler comprising:

a tubular outer structure defining a passageway extending along a longitudinal axis between an inlet and an outlet, the longitudinal axis being located at a center of a cross-section of the tubular outer structure;

a tubular inner assembly disposed within the tubular outer structure and movable along the longitudinal axis in the passageway between a first position and a second position, the tubular inner assembly including:

a yoke including a plurality of apertures and a first contact area, the plurality of apertures perforating the yoke and being spaced from the longitudinal axis, and the first contact area being coincident with the longitudinal axis; and

a water tube supporting the yoke;

a closure assembly including a surface occluding a flow of water in the passageway when the tubular inner assembly is proximate the first position;

a bar extending between a first end engaging the first contact area of the yoke and a second end engaging the closure assembly when the tubular inner assembly is proximate the first position; and

a fluid deflecting structure proximate the outlet of the tubular outer structure.

108. The dry sprinkler of claim 107, wherein the yoke comprises a generally planar support plate having a thickness measured parallel to the longitudinal axis between first and second surfaces, each of the first and second surfaces having a surface area that is less than the cross-sectional area of the passageway generally perpendicular to the longitudinal axis, the first surface of the generally planar support plate faces the inlet, the second surface of the generally planar support plate faces the outlet.

109. The dry sprinkler of claim 108, wherein the closure assembly comprises a second contact area, and the second end of the bar engages the second contact area when the tubular inner assembly is proximate the first position.

110. The dry sprinkler of claim 109, wherein the bar disengages from at least one of the first and second contact areas when the inner tubular assembly moves from the first position towards the second position.

111. The dry sprinkler of claim 110, wherein the surface area of the yoke is sized to prevent passage of the bar through the yoke.

112. The dry sprinkler of claim 111, wherein the surface areas of the first and second surfaces include a plurality of apertures, the plurality of apertures perforating the yoke and connecting the first and second surfaces.

113. The dry sprinkler of claim 112, wherein the closure assembly comprises a first recess and the yoke comprises a second recess and the second end of the bar engages the second recess when the tubular inner assembly is proximate the first position.

114. The dry sprinkler of claim 113, wherein the bar disengages from one of the first and second recesses when the inner tubular assembly moves from the first position towards the second position.

115. A dry sprinkler comprising:

a tubular outer structure defining a passageway extending along a longitudinal axis between an inlet and an outlet, the longitudinal axis being located at a center of a cross-section of the tubular outer structure;

a tubular inner assembly disposed within the tubular outer structure and movable along the longitudinal axis in the passageway between a first position and a second position, the tubular inner assembly including:

a yoke including a support surface, a contact surface, and a dislodgment aperture, the support surface being spaced from the longitudinal axis and the contact surface being coincident with the longitudinal axis; and

a water tube supporting the yoke by contact of the water tube against the support surface;

a closure assembly including a surface occluding a flow of water in the passageway when the tubular inner assembly is proximate the first position;

a post supporting the closure assembly with respect to the yoke when the tubular inner assembly is proximate the first position;

a dislodgment member including a base and a projection, the base being supported by the tubular outer structure, and projection extending from the base toward the inlet of the tubular outer structure, the projection being aligned with and spaced from the dislodgment aperture when the tubular inner assembly is proximate the first position, and the projection penetrating the

dislodgment aperture and displacing the post when the tubular inner assembly moves from the first position towards the second position; and

a fluid deflecting structure proximate the outlet of the tubular outer structure.

116. The dry sprinkler of claim 115, wherein the yoke comprises a generally planar support plate having a thickness measured parallel to the longitudinal axis between first and second surfaces, each of the first and second surfaces having a surface area that is less than the cross-sectional area of the passageway generally perpendicular to the longitudinal axis.

117. The dry sprinkler of claim 116, wherein the post comprises a first oblique surface relative to the longitudinal axis, the projection comprises a second oblique surface relative to the longitudinal axis, and the first oblique surface cooperatively engages the second oblique surface when the tubular inner assembly moves from the first position towards the second position.

118. The dry sprinkler of claim 117, wherein the dislodgment aperture comprises an elongated slot extending radially with respect to the longitudinal axis, and wherein the surface area prevents passage of the closure member through the generally planar support plate.

119. The dry sprinkler of claim 118, wherein the surface areas of the first and second surfaces include a plurality of apertures, the plurality of apertures perforating the yoke and connecting the first and second surfaces.

120. The dry sprinkler of claim 119, wherein the closure assembly comprises a recess, and the post engages the recess when the tubular inner assembly is proximate the first position.

121. The dry sprinkler of claim 120, wherein the water tube comprises at least one slot extending parallel to the longitudinal axis, and the base of the dislodgment member moves in the at least one slot when the inner tubular assembly moves from the first position towards the second position.

122. A dry sprinkler comprising:

a tubular outer structure defining a passageway extending along a longitudinal axis between an inlet and an outlet;

a tubular inner assembly disposed within the tubular outer structure and movable along the longitudinal axis in the passageway between first and second positions, the tubular inner assembly including:

a yoke having a first yoke support end and a second yoke support end;

a projection located between the first yoke support end and the second yoke support end, the projection extending away from the longitudinal axis so that the projection obstructs a flow of fluid on one side of the longitudinal axis from the inlet toward the inlet; and

a fluid tube coupled to the second yoke support end;

a closure assembly contacting the first yoke support end, the closure assembly occluding a flow of fluid in the passageway when the tubular inner assembly is proximate the first position, the closure assembly being moved to a side of the longitudinal axis via fluid flowing around the projection when the tubular inner assembly is in the second position;

a temperature responsive trigger assembly proximate the outlet of the tubular outer structure; and

a fluid deflecting structure proximate the outlet of the tubular outer structure.

123. The dry sprinkler of claim 122, wherein the yoke comprises two separate yoke support members, each yoke support member having an elongate member coupled to two legs extending away from the longitudinal axis to define an arcuate section within the outer tubular structure, the two yoke support members are coupled together along the longitudinal axis such that one leg of one yoke support member is adjacent another leg of another yoke support member so as to form a second arcuate section smaller than the first arcuate section.

124. The dry sprinkler of claim 123, wherein the projection comprises a generally planar surface orthogonal to the longitudinal axis and covering at least a portion of the second arcuate section between the one leg, the another leg and the inner surface of the outer tubular structure.

125. A dry sprinkler comprising:

a tubular outer structure defining a passageway extending along a longitudinal axis between an inlet and an outlet, the tubular outer structure defining a first fluid flow area symmetrical about the longitudinal axis proximate the inlet and a second fluid flow area asymmetrical about the longitudinal axis spaced between the first flow area and the outlet, the second fluid flow area being greater than the first fluid flow area;

a tubular inner assembly disposed within the tubular outer structure and movable along the longitudinal axis in the passageway between a first position, a second position, and an intermediate position between the first and second positions, the tubular inner assembly including:

a yoke having a first yoke support end and a second yoke support end; and

a fluid tube coupled to the second yoke support end;

a closure assembly supported by the first yoke support end, the closure assembly occluding a flow of fluid in the passageway when the tubular inner assembly is proximate the first position and permitting fluid flow through the outlet when the tubular inner assembly is proximate the second position, the closure assembly being moved to the asymmetrical flow area by a pressure differential between the first flow area and the second flow area;

a temperature responsive trigger assembly proximate the outlet of the tubular outer structure; and

a fluid deflecting structure proximate the outlet of the tubular outer structure.

126. The dry sprinkler of claim 125, wherein the first flow area comprises an annular cross-section about the longitudinal axis and the second flow area comprises a plurality of non-annular cross-sections.

127. The dry sprinkler of claim 126, wherein the tubular outer structure defining the passageway has a first inner diameter, a second inner diameter, and an intermediate diameter between the first and second diameters, the closure assembly occludes the first inner diameter when the tubular inner assembly is proximate the first position, the closure assembly is located within the intermediate diameter when the tubular inner assembly is in the intermediate position, and the closure assembly is located within the second diameter when the tubular inner assembly is in the second position.

128. A dry sprinkler comprising:

a tubular outer structure defining a passageway extending along a longitudinal axis between an inlet and an outlet, the longitudinal axis being located at a center of a cross-section of the tubular outer structure, the tubular outer structure having a projection extending toward the longitudinal axis;

a tubular inner assembly being disposed within the tubular outer structure and movable along the longitudinal axis in the passageway between a first position and a second position, the tubular inner assembly having a fluid tube, the fluid tube including a first bearing diametrically spaced apart from an aperture, the aperture having a groove extending along the longitudinal axis so that the tubular inner assembly is guided by the projection of the tubular outer structure along the longitudinal axis;

a closure assembly including a second bearing and a surface, the surface occluding a flow of fluid in the passageway when the tubular inner assembly is proximate the first position;

a member having a central journal located between a main journal and an impact shoe, the main journal being disposed within the first bearing of the tubular inner assembly, the central journal located in the second bearing of the closure assembly, and the impact shoe being disposed within the aperture, the impact shoe of the member cooperating with the projection to move a portion of the surface to a side of the longitudinal axis when the inner tubular assembly moves from the first position towards the second position;

a temperature responsive trigger assembly proximate the outlet of the tubular outer structure; and

a fluid deflecting structure proximate the outlet of the tubular outer structure.

129. The dry sprinkler of claim 128, wherein the central journal, main journal, and impact shoe lie in a plane that includes the longitudinal axis when the tubular inner assembly is proximate the first position.

130. The dry sprinkler of claim 129, wherein the central journal, main journal, and impact shoe lie in a plane that is oblique with respect to the longitudinal axis when the tubular inner assembly is proximate the first position.

131. A method of operating a dry sprinkler, the dry sprinkler having a structure extending along a longitudinal axis between an inlet and an outlet, the structure including a rated K-factor representing a flow of fluid from the outlet of the structure in gallons per minute divided by the square root of the pressure of the fluid fed into the inlet of the structure in pounds per square inch gauge, the method comprising:

locating a metallic disc annulus so that its central axis is skewed with respect to the longitudinal axis; and

verifying that a rate of water flow from the outlet is approximately equal to 95 percent of the rated K-factor of the structure multiplied by the square root of the pressure of water in psig fed to the inlet of the structure for each start pressure provided to the inlet prior to an actuation of the dry sprinkler at between approximately 0 to 175 psig.

132. The method of claim 131, wherein the verifying comprises supplying the start pressure at a magnitude of 20 psig or greater.

133. The method of claim 132, wherein the verifying comprises supplying the start pressure at a magnitude of 100 psig or greater.

134. The method of claim 132, wherein the verifying comprises providing a structure with a rated K-factor greater than 5.6.

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